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Towards a cavity-free future

How do we accelerate a policy shift towards increased resource allocation for caries prevention and control?

The Alliance for a Cavity-Free Future

Professor Nigel Pitts, Dr Marco Mazevet
and Catherine Mayne

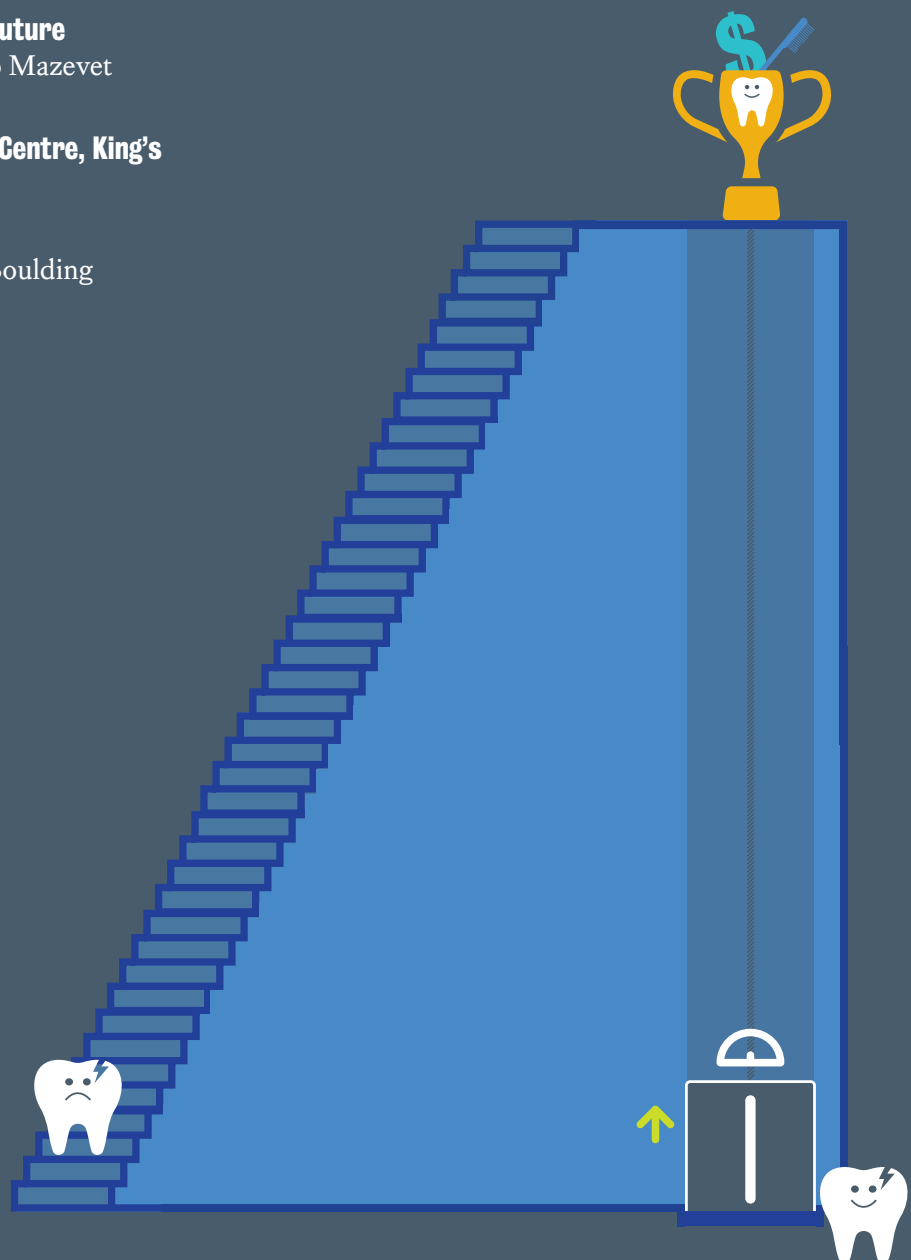
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The Policy Institute at King's

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Power of Numbers Ltd.

Ross Pow



June 2017

The Alliance for a Cavity-Free Future (ACFF)

The ACFF is a global not-for-profit organisation which seeks to promote integrated clinical and public health action to confront the disease burden of caries, fight caries initiation and progression, and, along with a global community of supporters, progress towards a Cavity-Free Future for all age groups. The ACFF was established in collaboration with a worldwide panel of experts in dentistry and public health who share a fervent belief in joining together across professional, geographic, and stakeholder lines, to create a unified global movement dutifully committed to combating caries in communities around the world.

For more information, please visit www.allianceforacavityfreefuture.org

Innovation and Translation Centre, King's College London Dental Institute (DITC)

The Dental Innovation and Translation Centre hosts the global office of ACFF. The DITC's aim is to collaborate to secure viable innovation and sustainable impacts for the future. The King's Strategic Vision 2029 guides the focus in collaborating to 'make the world a better place'.

For more information, please visit www.kcl.ac.uk/dentistry/innovation/innovation-and-translation-centre/Innovation

The Policy Institute at King's

The Policy Institute addresses complex policy and practice challenges with rigorous research, academic expertise and analysis focused on improving outcomes. Our vision is to contribute to building an ecosystem that enables the translation of research to inform policy and practice, and the translation of policy and practice needs into a demand-focussed research culture. We do this by bringing diverse groups together, facilitating engagement between academic, business, philanthropic, clinical and policy communities around current and future societal issues.

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Power of Numbers Ltd.

Power of Numbers facilitates complex, multi-stakeholder workshops that help make a breakthrough on big strategy and policy challenges. In designing and running such events, we identify the critical questions that need to be answered and deliver reliable ways of arriving at answers to these by blending well-proven facilitation methods with fresh and creative approaches that are unique to each situation.

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The views contained in this report are those of the authors alone and do not necessarily reflect those of the Policy Lab participants.

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How can I use this document?

The thoughts and actions outlined here are intended to help all those who are interested in working towards a cavity-free world, from practitioners to policymakers. This document can be used in a number of ways, and we highlight three here:

Inform

While the evidence and information needed to address a complex policy issue often already exists, we rarely have all the relevant data synthesised in a way that helps us make sense of the problem. The infographic and additional data provided here is intended to be a resource for advocates to inform both themselves and other stakeholders.

Contribute

This document also invites readers to contribute to facilitating a cavity-free world in several ways. It contains details of the projects developed by our broad range of expert participants, and invites readers to contribute their time, expertise and advocacy skills to one (or more!) of these projects. It also lists some of the exciting work that is already going ahead in this area, and readers are encouraged to facilitate this work where they can.

Advocate

Finally, in addition to inviting readers to contribute to existing and proposed projects, it is intended to act as a springboard to advocate for the achievement of a cavity-free world. A key message emerging from the Policy Lab is that while we have the evidence, tools and resources we need to reach this goal, it will only be achieved through innovation and commitment from a broad range of stakeholders.

Glossary of key terms

Cavity

A tooth with caries that has progressed far enough to produce a collapse in the integrity of the outer enamel, exposing the inner dentine. This stage of caries typically leads to a restoration or filling.

Caries prevalence

A population measure of the disease experience. Traditionally, survey methods have only recorded some later stages of caries (using the DMFT index) at the cavity threshold (D₃DMFT). More recently, comprehensive assessments of both early and late-stage disease provide an estimate of the total caries present.

DALYs

One DALY can be thought of as one lost year of 'healthy' life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. [WHO]

Dental caries

The disease and disease process known as tooth decay. Dental caries (tooth decay) is a dynamic, multifactorial disease in which the hard tissues of the teeth demineralise at a faster rate than they can replenish the minerals lost (remineralisation).

[If preventive or other management interventions are not put into place in the early stages, the caries process can progress to the stage of cavities in the teeth.]

DMFT

An index for measuring Decayed, Missing and Filled Teeth.

Non-communicable diseases (NCDs)

Medical conditions or diseases that are not caused by classical infectious agents. NCDs can refer to chronic diseases which last for long periods of time and progress slowly.

[The science underpinning caries causation has developed recently, with new understanding of the

oral microbiome. This means that previous concepts considering caries as an infectious disease are now outdated.]

Policy Lab

A collaborative session that brings together research, policy and practitioner expertise to assess the evidence, understand barriers and constraints to change and use this understanding to inform policy options that can help improve outcomes.

Payment system

The system that generates payments which directly determine or influence the personal income of the primary care dentist.

Prevention – primary

Prevention of the disease (in the absence of the disease).

Prevention – secondary

Prompt detection of early-stage disease in order to provide effective arrest and/or regression of caries prior to the cavity stage.

Prevention – tertiary

Prevention applied to later stages of caries (cavity stage). It aims to prevent further hard tissue destruction, pulpal involvement and tooth loss, and restore function and aesthetics while preventing the initiation of new disease.

Preventively oriented pathway

A clinical pathway which includes determining caries risk, detecting and assessing caries lesions, deciding on appropriate care from a menu of preventive and operative choices, and doing patient centered, tooth preserving care.

[ICCMSTM 4D is an example of such a preventively oriented pathway.]⁵

Restorative-only pathway

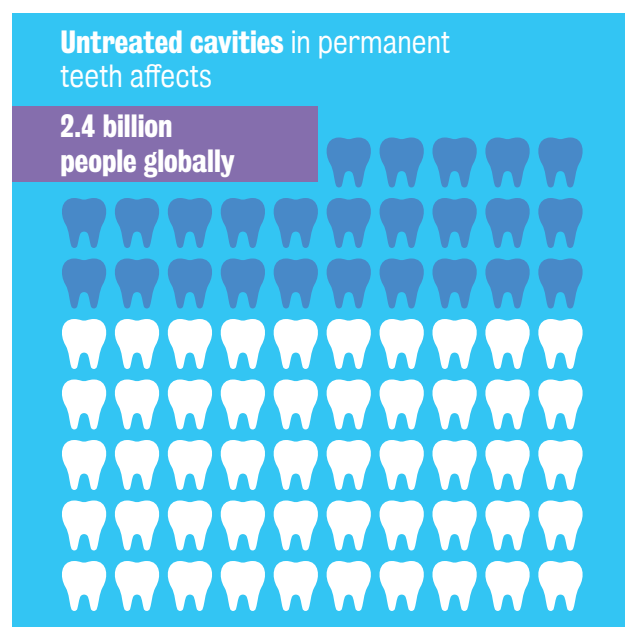
A clinical pathway from diagnosis to treatment planning which relies solely on surgical intervention as the treatment choice.

The current situation

One third of people across the world have untreated caries

Untreated caries in permanent teeth affects 2.4 billion people and was the most prevalent condition among all those evaluated in the Global Burden of Disease 2010 study.¹ Untreated caries in children's teeth was the 10th-most prevalent condition, affecting over 621 million children worldwide.²

Caries shares risk factors with other non-communicable diseases (NCDs) such as diabetes, so by decreasing the prevalence of caries and its associated common risk factors, we can also move towards improving general health.³



We do not need more evidence to show that preventing caries is possible

There is widespread acceptance that we have the science to be able to maintain teeth at a good level of health, either with sound surfaces, or contained at stages before the disease progresses to cavitated decay requiring restoration. A background community-based strategy for caries prevention, including appropriate use of fluoride (such as water fluoridation or other community-level provision), is important as a foundation. Focusing on maintaining tooth health at the individual level would prompt a shift in dental practice towards risk-centered direct prevention-based interventions (e.g. topical fluoride) and behaviour-based 'treatment' (e.g. advice on diet and dental hygiene).

Many countries have already taken steps to prioritise prevention and work towards being 'cavity-free', with prevention at both individual and population level becoming a priority in Scandinavian countries. An example of this is that the Danish Municipal Dental Health Service has for many years offered a comprehensive school-based programme covering clinical services, prevention and oral health education for both children and parents. In addition to supervised oral hygiene instructions, educational activities also relate to diet and nutrition more broadly, ensuring that both dental caries and associated common risk factors are addressed through the programme. These initiatives have resulted in noticeable improvements in the recorded dental health of children and adolescents.⁴ In some countries, specific prevention-based caries management protocols have been introduced for dental practitioners.



1 Global Burden of Disease Study 2010 (2012), *The Lancet*.
 2 Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJL and Marcenes W (2015). 'Global burden of untreated caries: a systematic review and metaregression', *Journal of Dental Research*, 94(5), 650–658.
 3 NCD Alliance and FDI World Dental Federation (2017) *Accelerating action on oral health and NCDs*. http://www.fdiworlddental.org/sites/default/files/media/resources/ncda_fdi-policy_brief_oral_health_ncds.pdf

4 Petersen PE, Kjoller M, Christensen LB and Krusturup U (2004). 'Changing dentate status of adults, use of dental health services, and achievement of national dental health goals in Denmark by the year 2000', *Journal of Public Health Dentistry*, 64(3), 127–35.

Key consideration points: The current situation

- 1. Dental caries:** A technical definition from Dental Science defines dental caries as ‘a biofilm-mediated, sugar-driven, multifactorial, dynamic disease that results in the phasic demineralization and remineralization of dental hard tissues’. If preventive and/or non-operative interventions are not put into place in the early stages, dental caries can progress to lesions involving macroscopic loss of the tooth’s surface integrity (**cavities**).⁵ This Policy Lab focused on achieving a cavity-free world (but it should be noted that arrested initial-stage caries may still exist).
- 2. The mean figures on prevalence hide complexity and skewed distributions.** The mean prevalence of caries (using the traditional D₃MFT index) has slowly been decreasing for children in many countries, but there is an increasingly uneven distribution in the population, with particular increase in caries prevalence at the geriatric end of the ageing population, who are retaining more teeth than ever before. Despite the widespread nature of tooth decay, reliable, standardised global data are limited and often exclude initial-stage disease.
- 3. There is a distinct socio-economic variation in the distribution of caries** that is apparent both at a country level and on a global scale. Broadly speaking, one could map the global population in four segments: those who show high compliance of preventing their caries, with lots of access to care; those who are willing to show high motivation but not much access to care (i.e. system does not support those in their position, socioeconomic status); those who do not show high compliance and yet have the needed access to care; and finally, those do not show high compliance, and also do not have much access to care (seriously disadvantaged).
- 4. Despite the widespread nature of tooth decay, reliable, standardised global data are limited.** This is largely because oral health data are not integrated in national disease surveillance, particularly in low- and middle-income countries. Separate national oral health surveys are complex and costly to conduct, and hence not prioritised. This lack of up-to-date epidemiologic information constrains the development of appropriate approaches to reduce the disease burden.⁶ Globally we have little adult longitudinal data, however the disease continues to affect patients throughout adulthood.^{2, 7}

Caries prevention: The current situation

Primary prevention

Prevention of disease in the absence of disease carried out to variable extents by separate public health groups (such as community-based fluoride strategies as a foundation for oral health) – but often not aligned to others involved with caries care where primary caries prevention is **not remunerated or incentivised**.

Secondary prevention

Prompt detection of early-stage disease in order to provide effective arrest and or regression prior to the cavity stage – this is often **not remunerated or incentivised** and so is often not practiced appropriately (either no assessment or preventive interventions delivered, or premature and inappropriate tertiary stage restorative treatment is delivered instead).

Tertiary prevention

For more advanced (cavitated) stages of lesion severity this aims to prevent further hard tissue destruction while restoring function and aesthetics and preventing the initiation of new disease. However, restorative care is often provided when not yet needed according to contemporary guidance (tooth structure destroying invasive surgical care provided, but often without any control of the aetiological or risk factors to prevent recurrence of caries). **Currently dentists are mostly paid per restorative treatment administered.**

5 Pitts NB, Zero D, Marsh P, Ekstrand K, Weintraub J, Ramos-Gomez J, Tagami J, Twetman S, Tsakos G and Ismail A (2017). ‘Dental caries’, *Nature Reviews Disease Primers*, 3(17030).

6 FDI World Dental Federation (2015). *The Challenge of Oral Disease: A Call for Global Action. The Oral Health Atlas*, 16–17.

7 Broadbent JM, Thomson WM and Poulton R (2008). ‘Trajectory Patterns of Dental Caries Experience in the Permanent Dentition to the Fourth Decade of Life’, *Journal of Dental Research*, 87(1), 69–72.

Policy Lab

How do we accelerate a policy shift towards increased resource allocation for caries prevention and control?

Despite the evidence and desire for change among many health professionals, it is clear that sufficient steps have not been taken globally to prioritise caries prevention.

To address this as an issue and explore potential future policy responses, the ACFF, DITC and the Policy Institute at King's, with assistance from facilitators 'Power of Numbers' hosted a Policy Lab meeting in June 2017.

Taking place over 24 hours from 28 to 29 June 2017, this intensive workshop brought together stakeholders who rarely meet or work together, and utilised the differing perspectives to explore in detail the issues around reaching consensus over this particular policy challenge.

Attendees were briefed prior to the event and prompted with the key questions for consideration,



particularly around the barriers faced when addressing the challenges posed by a policy shift towards prevention. An overview of the briefing pack can be found in the [online Appendix](#).

The session encouraged rapid, creative thinking to develop responses which were novel, but also practical and grounded in the existing evidence base. It combined an initial fast-paced, dynamic group work session establishing a view of the barriers and possible actions to accelerate progress with a more in-depth look at the issue, working through the challenges prevalent among different stakeholders and sectors with a view to developing a set of targeted actions. The lab culminated in the presentation of a holistic plan of action that addressed short, medium and longer-term requirements.

The Policy Lab was a breakthrough in convening a multi-faceted expert group, representing a variety of key stakeholders, who could advise on the required next steps in accelerating progress in shifting policy towards caries prevention and ultimately to move towards a cavity-free world.

scientific relations public health dentistry health policy specialists
behavioural psychology dental hygienists paediatric dentistry chief dental officers
dental practitioners public health dentistry cariology
health economists dental associations behavioural psychology
health economists dental hygienists dental practitioners cariology
scientific relations dental associations health policy specialists
chief dental officers

Barriers to accelerating a cavity-free future

Despite professional organisations advocating for change, so far little has been done globally to prioritise caries prevention and control for those inside or outside the dental access net.

The Policy Lab addressed this issue, exploring what might be the barriers to prioritising caries prevention across countries. Three key issues were identified:

Current payment systems do not support preventive interventions and dentists are not currently paid to ‘do prevention’

The majority of oral health systems for dentists have been built around providing later-stage treatment (such as dealing with cavities by filling). They are mainly on a ‘fee-for-service’ model, paying per treatment offered. This means there is currently no significant financial incentive for dentists to focus on prevention, and a shift towards preventive care may impact negatively on the dentist’s income.

This results in an overwhelming focus on the traditional ‘restorative-only pathway’, which is bad for the tooth, the person, and for the purse, as often an initial restoration leads later to more complex, repeated and expensive surgical procedures. Patients might also be wary or unwilling to accept paying fees geared towards preventive care rather than receiving a traditional surgical ‘treatment’.

Dental payment systems often sit to one side of other health and public health structures and can therefore be incompatible with these.

We still have not demonstrated to policymakers why a cavity-free future is worth it

Although dental caries affects billions around the world, there is a lack of reliable data on health outcomes available to inform solutions. Oral health data are not generally integrated in national disease surveillance, particularly in low- and middle-income countries.

Separate national oral health surveys are often complex and expensive to conduct, and are therefore not prioritised.⁸ The lack of standardised information undermines efforts to demonstrate the value of a cavity-free future.

Furthermore, there is often a lack of support for advocacy around dental caries, which is viewed by health agencies and the public as less serious than diseases such as cancer. A lack of understanding of the true cost of dental caries (balancing health benefits with economic value) means that the full benefit of being cavity-free is difficult to see.

To compete with other political and policy priorities, we need comprehensive economic analyses to demonstrate the value of action on cavities

Demonstrating to policymakers, the profession and the public that a shift towards preventive care can, in the long term, be cost-effective both for the patient and the health system needs systematic economic data that has not yet been collected.

⁸ FDI World Dental Federation (2015). *The Challenge of Oral Disease: A Call for Global Action. The Oral Health Atlas*, 16–17.

Demonstrating Value

Demonstrating the value of action on a particular policy priority can be challenging but has been done before in different ways.

The *futures study of dental decay* employed modelling of caries epidemiology and prevention data to estimate the health gain achievable if key public health and clinical preventive interventions were optimised over a reasonable period.⁹ This informed the original setting of caries prevention targets for 2026 by the European Chief Dental Officers and the Alliance for a Cavity-Free Future.

In other sectors, a recent study by RAND Europe on sleep deprivation estimated that up to 3 per cent of a country's GDP is lost due to lack of sleep.¹⁰ The WHO Action Plan on Antimicrobial Resistance (AMR), in addition to setting out advocacy and public awareness activities, also includes the development of an economic case for sustainable investment that takes account of the needs of all countries, and increased investment in new medicines, diagnostic tools, vaccines and other interventions.¹¹

Four principles and priority actions: A model of change

Following the work undertaken at the Policy Lab, four key actions have been identified which need to be prioritised to support and accelerate a shift towards a cavity-free world. These actions are essential as they look to provide the critical data, catalysts and information needed to motivate and engage the dental community and to ensure sufficient support and understanding when influencing policymakers.

To take these actions forward, we urge everyone to be mindful of certain principles which create a model of change that will enable the outcomes of these actions to be more effective and respond to a diverse, global community:



Consider the two different target groups: Those excluded without access to care; and those with access to care which may no longer be appropriate by being too surgically biased.

Accelerating a shift towards prevention requires an understanding of the experiences and behaviours of the population. Although individuals and families face different challenges, it can be useful to think about the level of access to care available to different population groups. Those who have lots of access to care may not receive the most appropriate treatment, while others may have little or no access to care, as a result of poor socio-economic conditions, and/or limited public health infrastructure to support oral health. Others with

access may not take advantage of the opportunities that they have due to low prioritisation of oral health. Within both groups consideration should be given to the different needs of those patients with low and high 'motivation' for treatment.



Take a 'glocal' approach to solutions: Examine global evidence but be mindful of the context and culture of each country and region in implementing actions.

Health systems around the world vary widely, both in terms of the populations that they serve and the specific public health challenges that they face, and the way in which health systems are structured. This variance is particularly profound in the area of oral health, and there is no 'one size fits all' solution to moving towards a prevention-based model of dentistry. However, it is important that we develop a globally relevant framework that can be adapted by countries to suit the conditions in which they are operating. This 'glocal' approach requires country assessments which take into account the key characteristics that determine how a preventive model might work in that context. Gross Domestic Product (GDP) per capita, total public spending on health and spending on dental health, 'out of pocket' spending on dental care, access to care and services offered, patient compliance and education, and country-wide patterns of nutrition should all be taken into consideration.

9 Bedi R (Ed) (2005). 'Reforming Dental Services in England: Policy Options', *Health Education Journal*, 64:4 (Supplement).

10 Hafner M, Marco, Stepanek M, Taylor J, Troxel WM and Van Stolk C (2017) *Why sleep matters*, RAND Europe.

11 World Health Organization (2015). *Global Action Plan on Antimicrobial Resistance*. <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>



Engage stakeholders: Tailor messages to multiple stakeholders (governments and health systems, dental teams and providers, patients and the public, payers and insurers, producers of professional guidance, dental and other industries). Accelerating a shift towards prevention is a complex task that requires support across a number of different sectors. Any action designed to promote prevention should both recognise and engage with those who will be part of effecting this change. A move towards prevention should consider whether solutions are economically viable and attractive to key stakeholders, and demonstrate an awareness of the social and political context in which they will be implemented.

To try and effectively work with this complex issue, we need to consider the six key stakeholder groups who can influence progress/lack of progress towards a Cavity-Free Future.

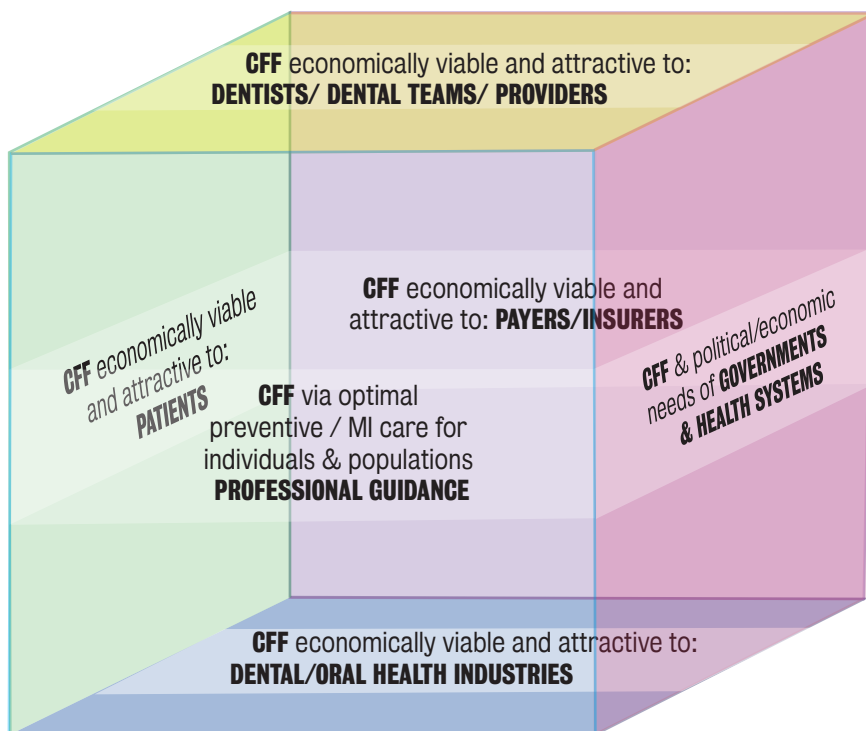


Learn from others: We also do not need to 'reinvent the wheel' for these actions. We can learn from what is already in place and developing to deliver more rapid progress towards a cavity-free world.

We must look to existing international experiences to show how a shift towards prevention is the preferred option for both dentists and patients. As we have seen, Scandinavian countries, as well as others, have taken steps towards promoting prevention-based care, emphasising the role of educational campaigns for parents and children, and, where possible, increasing spending on oral health. Looking at how prevention-based care has been proven to benefit overall oral health in trials and in these countries will enhance the strength of the preventive argument from multiple perspectives.

Win⁶ Cube

The Win⁶ Cube is a tool developed to show the six key stakeholders groups who can influence progress/lack of progress towards a Cavity-Free Future (CFF). These stakeholders must be considered if we are to work effectively with this complex issue.



Action 1

Demonstrate the value of a cavity-free world

As indicated earlier, the evidence that cavity prevention is possible already exists. But what will it cost our governments, payment systems and individuals to get there, how much will be saved by investing in a cavity-free future, and what benefits may accrue? This is something that many dental and other professionals suspect will be worth it, but has not yet been demonstrated. In other words, we do not yet know the full value of a cavity-free future.

Demonstrating to policymakers, professionals and the public that a shift towards preventive care can, in the long term, be cost-effective both for the patient and the health system needs systematic economic and comprehensive clinical data that has not yet been collected. The value calculations need to take into account the benefits delivered by a cavity-free future (for example, in terms of DALYs and other appropriate utility measures, including the harms/costs avoided) netted off against the investment needed to deliver these benefits.

One of the challenges in prioritising oral health is the concern that resources might be diverted away from other conditions. This is where a multisectoral approach to public health challenges is particularly useful in terms of demonstrating value. One could demonstrate that early intervention in initial-stage caries prevention could lead to the mitigation or avoidance of factors that lead to other health conditions. The cavity-free campaign, for example, advocates for a reduction in sugar consumption which, if implemented, could also have an impact on diabetes and obesity levels, and associated costs and benefits across these conditions.

It will also be important to exploit the 'health in all policies' agenda (HiAP).¹² This approach looks across public sectors to take account of the implications of public policies for health systems and the determinants of health, and advocates multisectoral responses to health challenges. For example, reducing the use of dental amalgam following the ratification of the Minamata Convention in August 2017 will rely on a

wide range of expertise from scientific, economic and legal communities, who will all need to contribute to the policy and planning process,¹³ which as a result will impact not only dental but other health and environmental groups.

One example of a step towards this action is the commitment of a number of Policy Lab participants to initiating and fundraising for an international competition to sponsor proposals with different methodologies to demonstrate the value of a cavity-free future – to be designed and started up within 12 months of the Policy Lab session. Further information on this initiative will be available on the ACFF website.

It is important for other groups to join in and take the necessary steps to implement Action 1. Steps should also be taken both at international level and within countries to start to collect appropriate data (with prevalence/disease data which includes initial-stage disease) that will be needed for the long-term assessment of the costs and impacts of caries management and cavity prevention. The collection of these data will be a big step in accelerating and refining progress towards a cavity-free future, and is something that should be actioned immediately for optimum impact.

While recognising the importance of this action, stakeholders should start now to accelerate the policy shifts and not await the outcome of this work before starting.

¹² The 8th Global Conference on Health Promotion, Helsinki, Finland, 10–14 June 2013. http://www.who.int/healthpromotion/conferences/8gchp/statement_2013/en/

¹³ United Nations Environment Programme (2013). *Minamata Convention on Mercury*. http://www.mercuryconvention.org/Portals/11/documents/Booklets/Minamata%20Convention%20on%20Mercury_booklet_English.pdf

Action 2



Create prevention payment systems

As we have seen, current payment systems do not typically pay dentists to ‘do prevention’ and there is no financial incentive for dentists to spend time and resources on the preventively oriented pathway. In order to see progress, this needs to change. We need to promote models for prevention-focused payment systems.

Understanding the value of a cavity-free future will play a critical part in persuading health systems (both the public and privately funded aspects) and the dental profession to move towards a system of payment for prevention. A key option in making this move is the need to demonstrate how allocating the available resources within dentistry and oral health to preventive treatments may allow the oral health system to be more efficient and a better use of the available resources.

While there will be local differences in suitable systems between countries, it is likely that capitation-based or performance-based payment systems will play

an important part of such prevention-focused payment models. However, experience suggests that a balance needs to be struck, as while fee-for-service payment systems often lead to overtreatment, those working within capitation systems may tend to undertreat (see Table 1).

The prototypes in England¹⁴ offer an opportunity to refine and promote a workable ‘payment for prevention’ model worldwide and energy should be put into these to create a set of models that could roll out to other countries as soon as possible.

A necessary supporting change will be in language and public expectations. The main shift needed here is moving away from the close association of making payments largely for surgical ‘treatments’ (e.g. fillings), and towards a broader concept of preventive ‘interventions and care’ (such as risk assessment, preventive advice and fluoride treatments) that patients are happy to invest in.

Table 1: Contrasting fee-for-service and capitation: a Cochrane review¹⁵

Fee-per-service	Capitation
Increased clinical activity (fillings and extractions)	Fewer fillings and extractions
Earlier restoration of caries	Caries restoration at a later stage
More frequent appointments	Less frequent appointments
Less preventive advice given to patients	More preventive advice given to patients
Dentists more likely to introduce innovations into their dental practice	A greater number of children were referred to the public dental service from dentists receiving capitation
Dentists felt more tempted to over-prescribe treatment	Dentists felt more tempted to under-prescribe treatment

An example of the NHS prototypes in England: Find examples of a range of initiatives on payment systems for primary care dentistry in our online appendices.

¹⁴ Primary Care Commissioning Community Interest Company (2016) ‘Dental contract reform’ [online]. www.pcc-cic.org.uk/resources/dental-contract-reform

¹⁵ Malone A and Conway DI (2015). ‘Payment methods may influence behaviour of primary care dentists’, *Evidence-Based Dentistry*, 16(1), 4–5.

Action 3



Expand and equip the dental workforce and increase inter-professional collaboration

Maximising the effectiveness of caries management will increasingly draw on a multi-disciplined workforce of teams made up of professionals with a mix of skills best suited to the environment they work in and the range of patients they support. This involves empowering the existing workforce with the knowledge they need and also, where possible, expanding the range of people who can advise, refer and (in some cases) treat around issues of dental health.

For the existing workforce, we already know what is needed to deliver effective prevention, but the communication of this knowledge often fails to get the messages across. Work can commence immediately on strengthening these messages and using all available channels to communicate them so that dental teams fully understand leading-edge preventive practice.

In countries with well-established dental health systems, there is a proposal to pilot closer cooperation between medical and dental teams to jointly target young children. This will involve providing the medical teams with information and materials for prevention and referral with the aim of providing the right preventive interventions to children who might otherwise miss out on getting the support they need.

For countries with more limited access to dental care it will be important to identify common traits within the populations, developing a categorisation of countries in order to pilot and promote future workforce initiatives that are relevant to each type of country (for example, those that have little or no dental health system, those where the system is very fragmented and those where there is a functioning system but where there are significant inequalities in resources and access).

In some countries, this action may involve other workers within and outside the health systems who have access to patients, which can maximise the delivery of base-level caries advice and care. One example of an immediate project proposal is to work with communities in rural areas of less-developed countries with existing health worker networks, to train and support those health workers (who usually work in other health domains) to incorporate oral health assessment and onward referral into their routine contact with patients and the public. This would provide immediate benefits to the communities served and would also generate evaluation data on the effectiveness and impact of leveraging other 'on-the-ground' health professionals.



Action 4



Shift public and industry behaviours

A cavity-free future is only likely to be possible if governments also play a role in changing public behaviours towards sugar in ways similar to those seen with tobacco (for example, the use of tax measures, advertising regulations, etc.).

Direct incentives to parents are also already being used with good effect in certain countries (for example, requiring that children have dental check-ups to receive social benefit payments or before registering them in school). These approaches could be promoted more broadly.

There is also a role for different parts of industry (especially larger companies) to play – private

insurance, oral health, dental equipment and materials, food and drink and retail – to align their longer-term strategies with a socially responsible agenda and a shift to investing in prevention that is likely to become an imperative because of the unaffordable costs of the restorative-only model.

The ACFF has worked for many years around the world to offer services to shift public behaviour and to influence industry and policy in a number of ways, pushing forward the cavity-free agenda.

Full details of the work that has been undertaken around the world can be found in the ACFF Global Update Report, available in the [online Appendix](#).






What could this look like?



How can you take action?

During the Policy Lab five areas were identified in which the previous four actions can already be implemented, with initial plans made for potential projects which will be led by Policy Lab participants in order to lead the way and encourage others to develop similar schemes. Projects vary from

conceptual modelling, to on-the-ground actions, to changes that touch upon strategic barriers to progress. We encourage all stakeholders for whom dental health is a priority to consider how they might take action in one or more of the following areas or to create their own projects.

Action area	PL project	Facilitators	Description	Timeframe
1 Collect reliable and extensive data on the true value of being cavity-free 	Create a competition to model and estimate the value of a cavity-free world	Universities, researchers, funders	Identify academic partners and develop initial competition proposal, approach funders, e.g. the Wellcome Trust, develop and run competition with funders, award grant and monitor project progress, disseminate outputs	1 year to launch competition
2 Collect examples of existing programmes for remuneration for prevention 	Highlight the work achieved by the NHS prototypes in England as a worked example of paying for prevention	Office of the Chief Dental Officer England, British Dental Association, universities and others	Disseminate the step-by-step process already achieved and benefits to both patients and dentists. Seek to advance the process in England and globally	Ongoing
3 Raise awareness of caries with other health professionals 	Integrating oral health into primary care for children	GPs, nurses, paediatricians, health visitors	Mobilise partnerships between dental and medical practitioners, prepare materials for health worker education and referral, develop patient information appropriate for different ages	1 year
3 Identify workers with access to target patients, ensuring they are trained appropriately to offer primary prevention 	Integrate oral health into training for community health practitioners in low-income countries	National/district health authorities, community health workers, NGOs, Community Health Workers [CHW]	Initial assessment, partner with communities, develop and deliver training materials, roll out intervention through existing CHW programmes, set up for evaluation in year 2	1 year
3 4 Identify and action key targets for behaviour change 	Promote a healthy school environment to improve oral health	Head teachers, teachers, LEAs, parents	Link with low-sugar lobby and child health advocates, introduce school breakfast clubs, develop brand champions for schools promoting healthy eating	Ongoing

Our next steps

The ACFF, DITC and the Policy Institute at King's are committed to facilitating the implementation of the Policy Lab results, and will continue this work in the spirit of collaboration and progress.

To that end, it is important to recognise the growing number of initiatives happening at the time of writing which stem from the results of the Policy Lab and show a collaborative approach towards working for the shared goal across each of the Win⁶ stakeholders.

- **Platform for Better Oral Health in Europe** seeks to test initiatives flowing from the Policy Lab and disseminate them to the ACFF Chapters.
- **ICCMS"** seeks to take forward dissemination of its guidance materials using the Win⁶ Stakeholder Cube and focus on taking the Policy Lab messages to practitioners, patients and industry.
- **University of Porto, Portugal** seeks to promote examples of budget reallocation from treatment to early and preventive treatment
- **Health Economists Policy Lab Consortium** seeks to ensure appropriate methodology can be employed to address the Policy Lab agenda.
- **Office of the Chief Dental Officer England** seeks to share its experiences in piloting hybrid capitation models of paying for prevention.
- **FDI Chief Dental Officers/Dental Public Health Section** invited a report to its meeting at FDI Madrid, and has agreed to disseminate Policy Lab Infographic (see back cover) and report to CDOs worldwide.
- **King's College London Dental Institute** has agreed to promote Minimally Invasive Restorative Care (MI-RC) globally to all six types of stakeholders.

The Alliance for a Cavity-Free future reported the outcomes of the Policy Lab to a global summit meeting at the FDI World Dental Federation meeting in August 2017. The results of the Policy Lab have influenced the creation of educational materials for the public and dental and health professionals as part of the 'World Cavity-Free Future Day' initiative and were considered in detail at the October ACFF Expert Panel meeting in Washington DC.

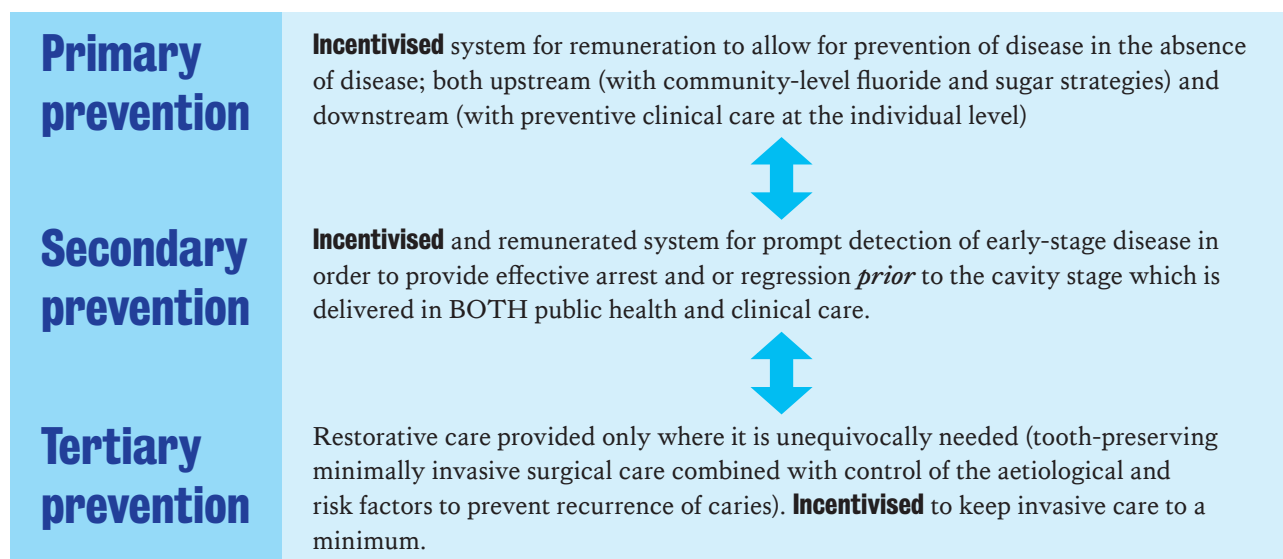
The ACFF and DITC will be leading on a publication outlining outcomes from this Policy Lab meeting, to be published in a UK journal in the first half of 2018.

A second Policy Lab event will be organised, following on from the outcomes of this and looking to involve insurers and other financial stakeholders.

All action is important, and we encourage all stakeholders to initiate this discussion within their organisations, countries and communities. It is only by working together that we can truly expect to see tangible results, and push further towards achieving a cavity-free future.



Proposed integrated solution: 3-tiered preventive caries care



Ekstrand KR, Ricketts DN and Kidd EA (2001). 'Occlusal caries: pathology, diagnosis and logical management', *Dental Update*, 28(8), 380–7.

Kidd EAM, Banerjee A, Ferrier S, Longbottom C and Nugent Z (2003). 'Relationships between a visual ranked caries scoring system and two histological validation techniques; a laboratory study on occlusal and approximal carious lesions', *Caries Research*, 37, 125–9.

Pitts NB and Ekstrand KR (2013). 'International Caries Detection and Assessment System (ICDAS) and its International Caries Classification and Management System (ICCMS™) – methods for staging of the caries process and enabling dentists to manage caries', *Community Dental Oral Epidemiology*, 41, e41–e52.

Ismail AI, Tellez M, Pitts NB, Ekstrand KR, Ricketts D, Longbottom C, Eggertsson H, Deery C, Fisher J, Young DA, Featherstone JDB, Evans RW, Zeller GG, Zero D, Martignon S, Fontana M and Zandona A (2013). 'Caries management pathways preserve dental tissues and promote oral health', *Community Dental Oral Epidemiology*, 41, e12–e40.

Pitts NB, Zero D, Marsh P, Ekstrand K, Weintraub J, Ramos-Gomez J, Tagami J, Twetman S, Tsakos G and Ismail A (2017). 'Dental caries', *Nature Reviews Disease Primers*, 3(17030).

Banerjee A (2017). 'Minimum intervention – MI inspiring future oral healthcare?', *British Dental Journal*, 223, 133–5.

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References

Appendix

<https://goo.gl/o1nzUe>

Bedi R (Ed) (2005). 'Reforming Dental Services in England: Policy Options', *Health Education Journal*, 64(4) (Supplement).

Broadbent JM, Thomson WM and Poulton R (2008). 'Trajectory Patterns of Dental Caries Experience in the Permanent Dentition to the Fourth Decade of Life', *Journal of Dental Research*, 87(1), 69–72.

Ekstrand KR, Ricketts DN and Kidd EA (2001). 'Occlusal caries: pathology, diagnosis and logical management', *Dental Update*, 28(8), 380–7.

FDI World Dental Federation (2015). *The Challenge of Oral Disease: A Call for Global Action. The Oral Health Atlas*, 16–17.

Global Burden of Disease Study 2010 (2012). *The Lancet*.

Hafner M, Marco, Stepanek M, Taylor J, Troxel WM and Van Stolk C (2017). *Why sleep matters*, RAND Europe.

Ismail AI, Tellez M, Pitts NB, Ekstrand KR, Ricketts D, Longbottom C, Eggertsson H, Deery C, Fisher J, Young DA, Featherstone JDB, Evans RW, Zeller GG, Zero D, Martignon S, Fontana M and Zandona A (2013). 'Caries management pathways preserve dental tissues and promote oral health', *Community Dental Oral Epidemiology*, 41, e12–e40.

Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJL and Marcenes W (2015). 'Global burden of untreated caries: a systematic review and metaregression', *Journal of Dental Research*, 94(5), 650–658.

Kidd EAM, Banerjee A, Ferrier S, Longbottom C and Nugent Z (2003). 'Relationships between a visual ranked caries scoring system and two histological validation techniques; a laboratory study on occlusal and approximal carious lesions', *Caries Research*, 37, 125–9.

Malone A and Conway DI (2015). 'Payment methods may influence behaviour of primary care dentists', *Evidence-Based Dentistry*, 16(1), 4–5.

NCD Alliance and FDI World Dental Federation (2017). *Accelerating action on oral health and NCDs*. http://www.fdiworlddental.org/sites/default/files/media/resources/ncda_fdi-policy_brief_oral_health_ncds.pdf

Petersen PE, Kjoller M, Christensen LB and Krstrup U (2004). 'Changing dentate status of adults, use of dental health services, and achievement of national dental health goals in Denmark by the year 2000', *Journal of Public Health Dentistry*, 64(3), 127–35.

Pitts NB and Ekstrand KR (2013). 'International Caries Detection and Assessment System (ICDAS) and its International Caries Classification and Management System (ICCMS™) – methods for staging of the caries process and enabling dentists to manage caries', *Community Dental Oral Epidemiology*, 41, e41–e52.

Pitts NB, Zero D, Marsh P, Ekstrand K, Weintraub J, Ramos-Gomez J, Tagami J, Twetman S, Tsakos G and Ismail A (2017). 'Dental caries', *Nature Reviews Disease Primers*, 3(17030).

Primary Care Commissioning Community Interest Company (2016). 'Dental contract reform' [online]. www.pcc-cic.org.uk/resources/dental-contract-reform

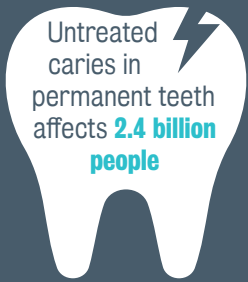
The 8th Global Conference on Health Promotion, Helsinki, Finland, 10–14 June 2013. http://www.who.int/healthpromotion/conferences/8gchp/statement_2013/en/

United Nations Environment Programme (2013). *Minamata Convention on Mercury*. http://www.mercuryconvention.org/Portals/11/documents/Booklets/Minamata%20Convention%20on%20Mercury_booklet_English.pdf

World Health Organization (2015). *Global Action Plan on Antimicrobial Resistance*. <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>

How do we accelerate a policy shift towards increased resource allocation for caries prevention and control?

The problem



Caries shares risk factors with other non-communicable diseases such as diabetes and metabolic syndrome. It is vital to balance the risk factors with protective factors.



Caries is not distributed evenly across populations, and there are two contrasting target groups when dealing with this issue:

- Those excluded groups without access to care
- Those with access to types of care which may no longer be appropriate

The Policy Lab (28-29 June 2017)



We found that a cavity-free world **is achievable** and many countries have taken steps to get there.

was a **breakthrough** in convening a multi-faceted expert group that could advise on how to more quickly achieve a **cavity-free world**. The members of the group rarely meet or work together and often have very different focuses.



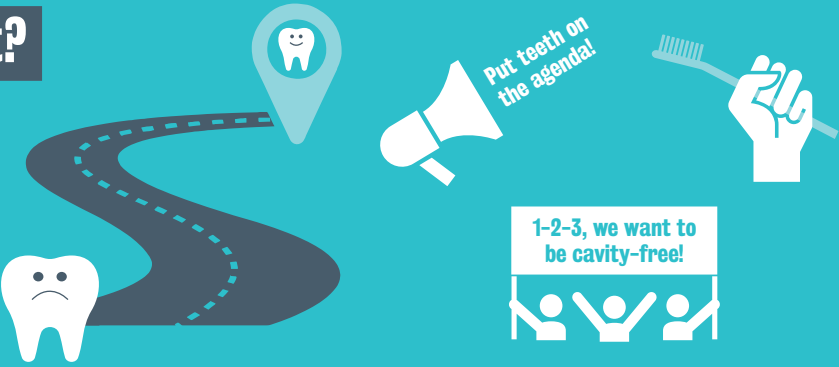
We do not need more evidence to show that preventing cavities is possible



So why are we not there yet?

We have still **not demonstrated** to policymakers why a cavity-free future is worth it.

To compete with other political and policy priorities, we need **comprehensive economic analyses** to demonstrate the value of action on cavities.



Help us accelerate progress towards a cavity-free world

Learning from current global experiences and developments, we must:



Demonstrate the value of a cavity-free world to: professionals, the public and policymakers



Create prevention-based payment systems



Better equip the dental and healthcare workforce



Shift public and industry behaviours

to deliver more rapid progress